

REMARKS

The Examiner has required an election in the present application between:

Species illustrated in Figs. 1-2, 3, 4-5, 6, 7-8, 9-11, 12-14, 15-17, 18-19, 20-22, 23, and 24.

For the purpose of examination of the present application, Applicants elect Species illustrated in Figs. 9-11, without traverse.

Claims 1-3, 5, 7-8, 17, 19 and 21 are read on the elected species. The remaining, non-elected claims are subject to possible rejoinder based on dependence from an allowable elected claim.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to our Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under § 1.17; particularly, extension of time fees.

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Respectfully submitted,

By 

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Claims 1-32 do not involve an inventive step in the sense of Article 22, Item 3 of Patent Law.

1. Claim 1 claims a fuel cell power generation and refrigeration system. Reference 1 (JP2001-231176A) discloses a kind of fuel cell system (see Abstract, paragraphs 4-42 of the specification, and Fig. 4) and specifically discloses the following technical features in detail. That is, power generated by a fuel cell 1 is provided to drive a load 4 and, in the case in which an amount of power required by the load 4 is equal to or less than an amount of power generated by the fuel cell 1 (i.e. total power required by the load stays below the capacity of the fuel cell or the load is shut off), a bidirectional DC-AC converter 12 is activated to convert excess power (i.e. power generated by the fuel cell) into AC power which is transferred to an AC system 13 (i.e. the commercial power network). The technical features distinguishing Claim 1 from Reference 1 are that the load comprises a vapor-compression refrigerating machine, the power generated by the fuel cell feeds a compressor drive motor of the refrigerating machine, and the whole system is a fuel cell power generation and refrigeration system. However, a vapor-compression refrigerating machine is a common kind of electric load, a fuel cell is a common technical means for a person having ordinary skill in the art to feed a compressor drive motor of a vapor-compression refrigerating machine so as to operate the refrigerating machine, and the whole system constitutes a fuel cell power generation and refrigeration system in the case where the load is a vapor-compression refrigerating machine. Therefore, it would have been obvious for a person

having ordinary skill in the art to combine the above common technical means with the basic teachings from Reference 1 to obtain the technical solution as claimed in Claim 1. Because Claim 1 exhibits neither an outstanding and substantial feature nor remarkable progress, Claim 1 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law.

2. Claim 1 claims a fuel cell power generation and refrigeration system. Reference 1 (JP2001-231176A) discloses a kind of fuel cell system (see Abstract, paragraphs 4-42 of the specification, and Fig. 4) comprising a load 4, a fuel cell 1 and a DC-DC converter 6 (i.e. power converting means) which uses the output of the fuel cell as an input and supplies operating power to the load 4. Therefore, the DC-DC converter 6 will necessarily convert the output of the fuel cell into the predetermined power which is supplied to the load. A power supply control section supplies the power generated by the fuel cell 1 to drive the load 4 and, in the case in which an amount of power required by the load 4 is equal to or less than an amount of power generated by the fuel cell 1 (i.e. total power required by the load stays below the capacity of the fuel cell or the load is shut off), a bidirectional DC-AC converter 12 is activated to convert excess power (i.e. power generated by the fuel cell) into AC power which is transferred to an AC system 13 (i.e. the commercial power network). In the case in which an amount of power required by the load 4 is equal to or more than an amount of power generated by the fuel cell 1, the bidirectional DC-AC converter 12 converts AC power from the AC system 13 into DC power which is transferred to the load 4 via an power supply device 3 between the AC

system 13 and the load 4. The power supply device 3, which uses the power from the AC system 13 as an input and supplies operating power to the load 4, corresponds to the power board.

The technical features distinguishing Claim 2 from Reference 1 are that: 1) the load comprises a vapor-compression refrigerating machine and the power generated by the fuel cell feeds a compressor drive motor of the refrigerating machine; 2) the power generated by the fuel cell is supplied to the commercial power network via the power board; and 3) the whole system is a fuel cell power generation and refrigeration system.

With regard to the above distinguishing feature 1), a vapor-compression refrigerating machine is a common kind of electric load and a fuel cell is a common technical means for a person having ordinary skill in the art to feed a compressor drive motor of the vapor-compression refrigerating machine so as to operate the refrigerating machine.

With regard to the above distinguishing feature 2), it is a common technical means for a person having ordinary skill in the art to provide a power board between a fuel cell 1 and AC system 13 to supply the power generated by the fuel cell to the commercial power network via the power board.

With regard to the above distinguishing feature 3), the whole system constitutes a fuel cell power generation and refrigeration system in the case

where the load is a vapor-compression refrigerating machine.

Therefore, it would have been obvious for a person having ordinary skill in the art to combine the above common technical means with the basic teachings from Reference 1 to obtain the technical solution as claimed in Claim 2. Because Claim 2 exhibits neither an outstanding and substantial feature nor remarkable progress, Claim 2 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law.

3. Claim 3 depends from Claim 1 or 2. It is a common technical means for a person having ordinary skill in the art that the power converting means between the commercial power network and the compressor drive motor and the power converting means between the fuel cell and the compressor drive motor share the one and same inverter to reduce the footprint and construction costs of the system. Therefore, Claim 3 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 1 and 2, from which Claim 3 depends, do not involve an inventive step.

4. Claim 4 depends from Claim 3. It is a common technical means for a person having ordinary skill in the art to employ a plurality of compressors for the vapor-compression refrigerating machine and arrange a plurality of inverters each for one of the compressors, to increase the effect of refrigeration. It is natural for a person having ordinary skill in the art to increase or decrease the number of operating compressors according to

required operating load of the refrigerating machine and, in the case in which one or more of the compressors are not operating, it is a common technical means for a person having ordinary skill in the art to supply power generated by the fuel cell to the commercial power network from the inverters for the compressors that are not operating. Therefore, Claim 4 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 3, from which Claim 4 depends, does not involve an inventive step.

5. Claim 5 depends from Claim 3. Reference 1 discloses adoption of a bidirectional AC-DC inverter as an AC-DC converter to be connected with the commercial power network 13 (see Fig. 4). Therefore, Claim 5 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 3, from which Claim 5 depends, does not involve an inventive step.

6. Claim 6 depends from Claim 3. It is a common technical means for a person having ordinary skill in the art to employ a plurality of compressors for the vapor-compression refrigerating machine to increase the effect of refrigeration. It is also common technical means to connect motors for driving some of the compressors directly to the commercial power network. Therefore, Claim 6 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 3, from which Claim 6 depends, does not involve an inventive step.

7. Claim 7 depends from Claim 5. Reference 1 discloses that an amount of power generated by the fuel cell 1 (i.e. the capacity of the fuel cell) is set higher than an usual amount of power used by the load so that excess power (i.e. generated power) is supplied to the commercial power network 13 via the bidirectional DC-AC converter 12 (see Abstract, paragraphs 40-42 of the specification, and Fig. 4). Based on the above basic teachings from Reference 1, it would have been obvious for a person having ordinary skill in the art to set capacity of a fuel cell to be higher than a capacity of an inverter supplying operating power to the compressor drive motor of a vapor-compression refrigerating machine and, in the case where the fuel cell is operating at the maximum capacity, it is natural for a person having ordinary skill in the art to supply generated power to the commercial power network via the bidirectional AC/DC converter. Therefore, Claim 7 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 5, from which Claim 7 depends, does not involve an inventive step.

8. Claim 8 depends from Claim 1 or 2. It is a common technical means for a person having ordinary skill in the art to feed a fuel cell power generation and refrigeration system with power from a commercial power network. A person having ordinary skill in the art will readily appreciate that the amount of power supply from the commercial power network may be detected to appropriately control the amount of power generated by the fuel cell and the power output from the fuel cell power generation and refrigeration system in response thereto. Therefore, Claim 8 does not

involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 1 and 2, from which Claim 8 depends, do not involve an inventive step.

9. Claim 9 depends from Claim 1 or 2. Reference 1 discloses a battery 2 connected in parallel with the fuel cell 1 (see Fig. 4). Therefore, Claim 9 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 1 and 2, from which Claim 9 depends, do not involve an inventive step.

10. Claim 10 depends from Claim 1 or 2. It is a common technical means for a person having ordinary skill in the art to feed a fuel cell power generation and refrigeration system with power from a commercial power network. It is also a common technical means for a person having ordinary skill in the art to detect the amount of power supply from the commercial power network and, in the case where it is detected that the power supply from the commercial power network has been reduced to a degree that may cause reverse power flow, forcibly increase an operating capacity of the vapor-compression refrigerating machine until the fuel cell follows the load, in view of the fact that an operating capacity of a fuel cell could not follow rapid fluctuation in a load. Therefore, Claim 10 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 1 and 2, from which Claim 10 depends, do not involve an inventive step.

11. Claim 11 depends from Claim 1 or 2. It is a common technical means for a person having ordinary skill in the art to provide a customer with a plurality of fuel cell power generation and refrigeration systems in order to increase the effect of refrigeration. Therefore, Claim 11 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 1 and 2, from which Claim 11 depends, do not involve an inventive step.

12. Claim 12 depends from Claim 1 or 2. It is a common technical means for a person having ordinary skill in the art to provide a customer with a plurality of fuel cell power generation and refrigeration systems in order to increase the effect of refrigeration. It is also a common technical means for a person having ordinary skill in the art to provide a common controller for controlling operation of fuel cells of the plurality of fuel cell power generation and refrigeration systems so as to reduce the cost. Therefore, Claim 12 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 1 and 2, from which Claim 12 depends, do not involve an inventive step.

13. Claim 13 depends from Claim 1 or 2. A person having ordinary skill in the art will consider that control of operation of fuel cells may correspond to power output control of the fuel cell power generation and refrigeration system. Accordingly, in view of the fact that the technical solution, in which the amount of power supply from the commercial power network to a system inside a building including the fuel cell power

generation and refrigeration system is detected to control power output of the fuel cell power generation and refrigeration system in response thereto, does not involve an inventive step (see the above comments regarding Claim 8), a person having ordinary skill in the art will readily appreciate that the controller provided in common may control operation of the fuel cells in order to further reduce the cost. Therefore, Claim 13 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 1 and 2, from which Claim 13 depends, do not involve an inventive step.

14. Claim 14 depends from Claim 1 or 2. Reference 2 (JP2002-198079A) discloses a kind of fuel cell system (see Abstract and Fig. 1) comprising fee memories 14, 15 (i.e. fee output means) for outputting power charges and fuel charges and a controller 11 (i.e. control means) for controlling the operation of the fuel cell and performing distribution control of output power in response to the charges. Accordingly, the additional technical features of Claim 14 have been disclosed in view of Reference 2 and the effect thereof in Claim 14 is the same as that in Reference 2, that is, to provide convenience to customers. Thus, Reference 2 suggests that the above additional technical features may be introduced to the invention so as to provide convenience to customers. Therefore, Claim 14 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 1 and 2, from which Claim 14 depends, do not involve an inventive step.

15. Claim 15 depends from Claim 14. It would have been obvious for a person having ordinary skill in the art to allow unit cost data and fee calculation software for fee calculation in the fee output means to be rewritten from a remote place (e.g. by an electric power department) so as to allow a customer to save time for entering the data. Therefore, Claim 15 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 14, from which Claim 15 depends, does not involve an inventive step.

16. Claim 16 depends from Claim 1 or 2. A vapor-compression refrigerating machine utilizing a direct expansion cycle is a common kind of refrigerating machine in practice. Therefore, Claim 16 does not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 1 and 2, from which Claim 16 depends, do not involve an inventive step.

17. Claims 17, 19, 21, 23, 25, 27, 29 and 31 depend from Claim 3. The additional technical features of these Claims correspond to those of Claim 8-14 and 16 respectively. In view of the above comments regarding Claim 8-14 and claim 16, therefore, Claim 17, 19, 21, 23, 25, 27, 29 and 31 do not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claim 3, from which these Claims depend, does not involve an inventive step.

18. Claims 18, 20, 22, 24, 26, 28, 30 and 32 depend from any of

Claims 4-7. The additional technical features of these Claims correspond to those of Claim 8-14 and 16 respectively. In view of the above comments regarding Claim 8-14 and claim 16, therefore, Claim 18, 20, 22, 24, 26, 28, 30 and 32 do not involve an inventive step in the sense of Article 22, Item 3 of Patent Law as long as Claims 4-7, from which these Claims depend, do not involve an inventive step.

(1) Copy of the Chinese Office Action and English translation thereof issued on February 15, 2008.

The following is English translation of an extract from the above-identified document relevant to the present application.